

**IN THE UNITED STATES DISTRICT COURT  
FOR THE EASTERN DISTRICT OF TEXAS  
MARSHALL DIVISION**

STATON TECHIYA, LLC and SYNERGY  
IP CORPORATION,

Plaintiffs,

v.

SAMSUNG ELECTRONICS CO., LTD and  
SAMSUNG ELECTRONICS AMERICA,  
INC.,

Defendants.

Civil Action No. 2:21-cv-00413-JRG

JURY TRIAL DEMANDED

**AMENDED COMPLAINT FOR PATENT INFRINGEMENT**

1. Staton Techiya, LLC (“Techiya”) and Synergy IP Corporation (“Synergy”) (Techiya and Synergy collectively “Plaintiffs”) bring this action for patent infringement under 35 U.S.C. § 271 against Defendants Samsung Electronics Co., Ltd., and Samsung Electronics America, Inc., (collectively, “Samsung” or “Defendants”) and allege as follows:

**THE PARTIES**

2. Plaintiff Staton Techiya is a Delaware limited liability company having a place of business at 9501 Jagged Creek Ct., Delray Beach, FL, 33446. It was founded in June 2017.

3. Plaintiff Synergy IP is a corporation of the Republic of Korea having a principal place of business at 5th floor, 54-1 Maeheon-ro, Seocho-gu, Seoul 06770, Republic of Korea. It was formed on June 30, 2020.

4. Defendant Samsung Electronics Co., Ltd. (“SEC”) is a Korean corporation having a principal place of business at 129, Samsung-Ro, Yeongtong-Gu, Suwon-si, Gyeonggi-do, 16677, Republic of Korea.

5. Defendant Samsung Electronics America, Inc. (“SEA”) is a New York corporation having a principal place of business at 85 Challenger Road, Ridgefield Park, New Jersey 07660.

6. On information and belief, SEA is a wholly owned subsidiary of SEC.

### **THE ASSERTED PATENTS**

7. United States Patent No. 8,111,839 (“the ‘839 Patent”), entitled “Always On Headwear Recording System,” issued on February 7, 2012, to inventors Steven Wayne Goldstein and John Usher. The ‘839 Patent issued from U.S. Patent App. Ser. No. 12/100,281, filed on April 9, 2008, and was previously published as U.S. Patent Pub. No. 2008/0253583 on October 16, 2008. A true and correct copy of the ‘839 Patent is attached as Exhibit A.

8. United States Patent No. 8,254,591 (“the ‘591 Patent”), entitled “Method and Device for Audio Recording,” issued on August 28, 2012, to inventors Steven Wayne Goldstein, John Usher, and Marc Andre Boillot. The ‘591 Patent issued from U.S. Patent App. Ser. No. 12/024,842, filed on February 1, 2008, and was previously published as U.S. Patent Pub. No. 2008/0187163 on August 7, 2008. A true and correct copy of the ‘591 Patent is attached as Exhibit B.

9. United States Patent No. 8,315,400 (“the ‘400 Patent”), entitled “Method and Device for Acoustic Management Control of Multiple Microphones,” issued on November 20, 2012, to inventors Steven Wayne Goldstein, John Usher, Marc Andre Boillot, and Jason McIntosh. The ‘400 Patent issued from U.S. Patent App. Ser. No. 12/135,816, filed on June 6, 2008, and was previously published as U.S. Patent Pub. No. 2009/0016542 on January 15, 2009. A true and correct copy of the ‘400 Patent is attached as Exhibit C.

10. United States Patent No. 9,124,982 (“the ‘982 Patent”), entitled “Always On Headwear Recording System,” issued on September 1, 2015, to inventors Steven Wayne

Goldstein and John Usher. The '982 Patent issued from U.S. Patent App. Ser. No. 14/021,011, filed on September 9, 2013, and was previously published as U.S. Patent Pub. No. 2014/0012403 on January 9, 2014. A true and correct copy of the '982 Patent is attached as Exhibit D.

11. United States Patent No. 9,270,244 ("the '244 Patent"), entitled "System and Method to Detect Close Voice Sources and Automatically Enhance Situation Awareness," issued on February 23, 2016, to inventors John Usher and Steven Wayne Goldstein. The '244 Patent issued from U.S. Patent App. Ser. No. 14/210,430, filed on March 13, 2014, and was previously published as U.S. Patent Pub. No. 2014/0270200 on September 18, 2014. A true and correct copy of the '244 Patent is attached as Exhibit E.

12. United States Patent No. 9,491,542 ("the '542 Patent"), entitled "Automatic Sound Pass-Through Method and System for Earphones," issued on November 8, 2016, to inventor John Usher. The '542 Patent issued from U.S. Patent App. Ser. No. 14/600,349, filed on July 30, 2013, and was previously published as U.S. Patent Pub. No. 2015/0215701 on July 30, 2015. A true and correct copy of the '542 Patent is attached as Exhibit F.

13. United States Patent No. 9,609,424 ("the '424 Patent"), entitled "Method and Device for Personalized Hearing," issued on March 28, 2017, to inventor Steven Wayne Goldstein. The '424 Patent issued from U.S. Patent App. Ser. No. 15/144,741, filed on May 2, 2016, and was previously published as U.S. Patent Pub. No. 2016/0249128 on August 25, 2016. A true and correct copy of the '424 Patent is attached as Exhibit G.

14. United States Patent No. 10,405,082 ("the '082 Patent"), entitled "Automatic Keyword Pass-Through System," issued on September 23, 2019, to inventor John Usher. The '082 Patent issued from U.S. Patent App. Ser. No. 16/168,752, filed on October 23, 2018, and

was previously published as U.S. Patent Pub. No. 2019/0124436 on April 25, 2019. A true and correct copy of the '082 Patent is attached as Exhibit H.

15. United States Patent No. 10,966,015 (“the ‘015 Patent”), entitled “Automatic Keyword Pass-Through System,” issued on March 30, 2021, to inventor John Usher. The ‘400 Patent issued from U.S. Patent App. Ser. No. 16/555,824, filed on August 29, 2019, and was previously published as U.S. Patent Pub. No. 2019/0387307 on December 18, 2019. A true and correct copy of the ‘015 Patent is attached as Exhibit I.

16. United States Patent No. 10,979,836 (“the ‘836 Patent”), entitled “Acoustic Sealing Analysis System,” issued on April 13, 2021, to inventors John Usher and John P. Keady. The ‘836 Patent issued from U.S. Patent App. Ser. No. 16/838,277, filed on April 2, 2020, and was previously published as U.S. Patent Pub. No. 2020/0275223 on August 27, 2020. A true and correct copy of the ‘836 Patent is attached as Exhibit J.

17. By way of assignment, Techiya is the owner of the ‘839 Patent, the ‘591 Patent, the ‘400 Patent, the ‘982 Patent, the ‘244 Patent, the ‘542 Patent, the ‘424 Patent, the ‘082 Patent, the ‘015 Patent, and the ‘836 Patent (collectively, the “Asserted Patents”). Synergy is the exclusive licensee of the Asserted Patents with the right to sublicense the Asserted Patents.

18. The Asserted Patents are each valid and enforceable.

19. Plaintiffs have not practiced any of the claims of the Asserted Patents and therefore have no obligation to mark under 35 U.S.C. § 287.

### **JURISDICTION AND VENUE**

20. This action arises under the Patent Act, 35 U.S.C. § 1 et seq.

21. Subject matter jurisdiction is proper in this Court under 28 U.S.C. §§ 1331 and 1338(a).

22. Venue in this District is proper under 28 U.S.C. § 1391(c)(1)-(3) and 28 U.S.C. §1400(b). SEC is not a resident of the United States and may be sued in this District, as suits against foreign entities are proper in any judicial district where they are subject to personal jurisdiction. SEA has a regular and established place of business in this District, at 6625 Excellence Way, Plano, TX, and at 1100 Klein Road, Plano, TX. On information and belief, SEA employs full-term personnel such as sales personnel and engineers in this District. Further, SEA is registered to conduct business in the State of Texas and has a Texas Taxpayer Number of 11329511536. SEC and SEA (collectively, “Samsung”) all have conducted and continue to conduct business in this District, and all have committed and continue to commit acts of patent infringement in this District.

23. This Court has personal jurisdiction over Samsung. Samsung has conducted and continues to conduct business within this District. Samsung, directly or through subsidiaries or intermediaries (including distributors, retailers, and others), ships, distributes, makes, uses, offers for sale, sells, imports, and/or advertises (including by providing interactive web pages) its products and/or services in the United States and this District and/or contributes to and actively induces its customers to ship, distribute, make, use, offer for sale, sell, import, and/or advertise (including the provision of interactive web pages) infringing products and/or services in the United States and this District.

24. Samsung, directly and through subsidiaries or intermediaries (including distributors, retailers, and others), has purposefully and voluntarily placed one or more of its infringing products and/or services, as described below, into the stream of commerce with the expectation that those products will be purchased and used by customers and/or consumers in this

District. These infringing products and/or services have been and continue to be made, used, sold, offered for sale, purchased, and/or imported by customers and/or consumers in this District.

25. On information and belief, Samsung has also placed the Samsung Galaxy S20 and other similar smartphones, the Samsung Galaxy Buds+ and other similar earphones, and the Bixby Personal Assistant app (the “Accused Products”) into the stream of commerce by shipping Accused Products into this District and shipping Accused Products into the United States knowing that those products would be shipped into this District.

### **JOINDER**

26. Joinder of Defendants is proper under 35 U.S.C. § 299. The allegations of patent infringement contained herein arise out of the same series of transactions or occurrences relating to the importing (or having imported) into the United States and/or making (or having made), using (or inducing the use of), selling, or offering for sale within the United States, the same Accused Products. Nonlimiting examples of these products include, but are not limited to Samsung Galaxy Buds Pro, Samsung Galaxy S20, and Buds+ imported, sold, offered for sale, and/or used in this District.

### **ALLEGATIONS OF PATENT INFRINGEMENT**

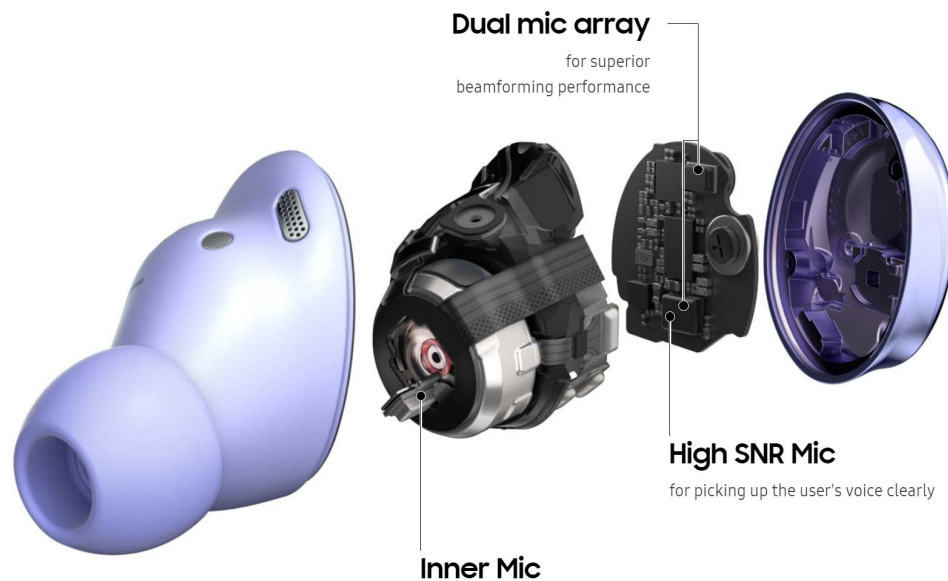
27. Plaintiffs incorporate the allegations of the foregoing paragraphs as if fully restated herein.

28. As set forth below, the Accused Products incorporate, without any license or permission from Plaintiffs, technology protected by the Asserted Patents. Plaintiffs respectfully seek relief from this Court for Defendants' infringement.

29. Samsung has and continues to make, have made, use, sell, offer for sale, import, have imported, test, design, and/or market in the United States smartphones and earphones that infringe the Asserted Patents.

30. Samsung has directly infringed, and continues to directly infringe, the Asserted Patents under 35 U.S.C. § 271(a) and (g) by making, using, selling and/or offering to sell, in this District and elsewhere in the United States, and/or importing into this District and elsewhere in the United States, certain Bixby-enabled smartphones and earphones which infringe the Asserted Patents, as further described in detail in Counts I-X, *infra* (collectively, “Accused Products”).

31. Using the Samsung Galaxy Buds Pro as a representative product for the infringement analysis, the Samsung Galaxy Buds Pro has one inner mic (ECM) and two outer mics (ASM). On information and belief, the Buds Pro includes a BCM 43015 SoC chipset which includes a digital signal processor that uses the RTOS operator system, includes a 2 way speaker, and has a high SNR microphone as the main microphone and also a sub microphone and an inner microphone.



*Source:* <https://www.samsung.com/global/galaxy/galaxy-buds-pro/specs/>

32. On information and belief, the same or similar processor and operating system is present in the Samsung Galaxy Buds 2, Samsung Galaxy Buds+, Samsung Galaxy Buds Live, Samsung Galaxy Buds 2, and other Samsung Galaxy earphones.

33. Using the Samsung Galaxy S20 as an example of infringing Samsung smartphones, on information and belief the Samsung Galaxy S20 includes a Snapdragon 865 processor, 12 GB of LPDDR5 RAM, 128 GB of flash storage, and four cameras.

*Source:* [https://ifixit-guide-pdfs.s3.amazonaws.com/pdf/ifixit/guide\\_131607\\_en.pdf](https://ifixit-guide-pdfs.s3.amazonaws.com/pdf/ifixit/guide_131607_en.pdf)

34. The Bixby platform is a software application which resides on the Samsung Galaxy S20 smartphone to provide voice assistant functionality. (*See*, for example, <https://www.samsung.com/global/galaxy/what-is/bixby/>.) The Bixby Platform allows a user to interact with the Samsung Galaxy S20 via use of the Samsung Galaxy Buds Pro to control various actions of the Samsung Galaxy S20. For example, the Bixby platform can be used for voice activation and control of audio and video recording operations by the Samsung Galaxy S20 and other Samsung Galaxy smartphones.

35. In the Samsung Galaxy S20, the Bixby platform can be voice-activated by the user speaking a command or phrase such as “Hi, Bixby.” The Bixby server(s) include at least a processor and processor readable memory where a digital vocabulary database of acoustic characteristics, e.g., temporal or spectral patterns, of verbal words which are sufficient to recognize many commands, such as the commands in the examples below:

“Hi Bixby take a selfie with a sticker.”

“Turn on Bluetooth.”

“Set media volume to 5.”

“Find Jane’s number.”

“Start recording in interview mode.”

“Change TV channel to 7.”

*Source:* <https://www.samsung.com/us/explore/bixby/>



36. In order for the Bixby platform to detect and understand a user's voice commands, the Bixby platform performs speech recognition and natural language analysis. The speech recognition requires comparing known information, i.e., the stored acoustic characteristics of words, with unknown information, i.e., characteristics of an acoustic signal from the microphone of the Samsung Galaxy S20 or Samsung Galaxy Buds Live.

Bixby, Samsung Electronics' intelligent voice assistant, is available in nine languages and on more than 160 million devices globally. Earlier this year, Samsung Electronics developed a new end-to-end (E2E) automatic speech recognition (ASR) engine for Bixby. The new ASR engine, based on the Transformer neural network architecture, simplified the training process, but also required more training data. Rapid training for the machine learning model became critical to maintaining Bixby as more languages were introduced to the service. To address this, Samsung Electronics chose to adopt Cloud TPUs to meet and exceed performance requirements for Bixby.

*Source:* <https://www.finchannel.com/technology/79646-google-s-cloud-tpus-increase-samsung-electronics-bixby-s-ai-model-training-speed-by-18x>

37. The Bixby platform can find and initiate calls to phone numbers in the address book of the Samsung Galaxy S20 and other similar Samsung smartphones.

*Source:* <https://www.samsung.com/us/explore/bixby/>

38. With notice of its infringement of the Asserted Patents, Samsung has proceeded to directly infringe by making, using, testing, designing, selling, offering to sell, and/or importing in this District and elsewhere in the United States the Bixby platform, smartphones and earphones that infringe the Asserted Patents.

39. Samsung was placed on notice of its infringement of each of the Asserted Patents at least as early as the date of the filing of the original complaint in this action on November 5, 2021.

40. Samsung has also indirectly infringed, and continues to indirectly infringe, the Asserted Patents under 35 U.S.C. § 271(b) and (c). Samsung contributes to and induces direct infringement by Samsung's distributors, customers, and end-users. For example, on information and belief, retailers such as the Walmart Supercenter at 1701 E End Blvd N, Marshall, TX 75670 offer Accused Products for sale. Such sale and later use by purchasers results in induced and/or contributory infringement of the Asserted Patents by Samsung.

41. Samsung knew and had specific intent to induce and encourage this direct infringement of the Asserted Patents by Samsung's customers, including the customers' importation, sales, use, and offer for sale of articles that are covered by the Asserted Patents.

42. Samsung also contributes to the foregoing infringement by customers by offering to sell, selling, and importing in the United States Samsung products that constitute all or a material part of the articles that practice the Asserted Patents. Samsung knows, or should have known, that such Samsung products have no substantial non-infringing uses, are a material part of the invention of each Asserted Patent, especially made or especially adapted for use in an infringement of such Asserted Patent and is not a staple article or commodity of commerce suitable for substantial non-infringing use.

43. Further, after notice of its infringement of the Asserted Patents, Samsung has proceeded to actively induce infringement of the Asserted Patents under 35 U.S.C. § 271(b) by:

inducing customers and/or other third parties to make, use, sell, offer for sale, market, advertise, and/or import Samsung Galaxy smartphones and Samsung earphones that infringe the Asserted Patents; and

inducing customers and/or other third parties to use Samsung Galaxy smartphones and Samsung earphones that infringe the Asserted Patents in combination with the Bixby platform.

44. Additionally, Samsung has indirectly infringed, and continues to indirectly infringe the Asserted Patents under 35 U.S.C. § 271(c) by materially contributing to infringement of the Asserted Patents by making, using, selling, offering for sale, advertising, marketing, and/or importing smartphones and earphones and Bixby-enabled versions thereof, which infringe the Asserted Patents, and by instructing those others to infringe the Asserted Patents, as described in detail in Counts I-X, *infra*.

45. Samsung's acts of infringement have caused damage to Plaintiffs. Plaintiffs are entitled to recover from Samsung the damages caused by Samsung's wrongful acts.

## **COUNT I**

### **Defendants' Infringement of the '839 Patent**

46. Plaintiffs incorporate the allegations of the foregoing paragraphs as if fully restated herein.

47. Plaintiff Techiya is the assignee and lawful owner of the '839 Patent and Plaintiffs hold all right, title and interest in and to the '839 Patent. The '839 Patent is valid and enforceable.

48. Defendants have directly infringed, and continue to directly infringe, the '839 Patent by making, using, selling, offering for sale, or importing into the United States products that infringe the '839 Patent including, but not limited to, the Accused Products. Further discovery may reveal additional infringing products and/or models.

49. For example, and without limitation, the Accused Products infringe at least claim 1 of the '839 Patent. The Accused Products fall within the scope of and include, either literally or under the doctrine of equivalents, all of the elements of the asserted claim of the '839 Patent.

50. Samsung Galaxy S20, Samsung Galaxy Buds Pro, and Samsung Galaxy Buds+ are exemplary products covered by at least claim 1 of the '839 Patent. On information and belief, many other products provided by, and to be provided by, Samsung infringe the '839 Patent.

51. The '839 Patent claims an Always-On Recording System (AORS) comprising: a first monitoring assembly mounted in an earpiece, the earpiece configured to occlude and form an acoustic seal of an ear canal, the first monitoring assembly including an Ambient Sound Microphone (ASM) to monitor an ambient acoustic field at an entrance to the ear canal occluded by the earpiece, the ASM producing an ASM signal responsive to the ambient acoustic field; a second monitoring assembly mounted in the earpiece and including an ear canal microphone (ECM) to monitor an acoustic field within the ear canal occluded by the earpiece, the ECM producing an ECM signal responsive to the acoustic field within the ear canal; a data storage device configured to act as a circular buffer for continually storing at least one of the ECM signal or the ASM signal; a further data storage device coupled to the data storage device; and a record-activation system including software configured to activate the further data storage device to record a content of the data storage device.

52. The Samsung Galaxy Buds+ is an earpiece configured to occlude and form an acoustic seal of an ear canal. At least one microphone is positioned to operate as a first monitoring assembly including an Ambient Sound Microphone (ASM) to monitor an ambient acoustic field at an entrance to the ear canal occluded by the earpiece. The ASM produces an ASM signal responsive to the ambient acoustic field. A second microphone of the earpiece is located in the ear canal and functions as an ear canal microphone (ECM) to monitor the acoustic field within the ear canal and to

produce an ECM signal responsive to the acoustic field within the ear canal. The Samsung Galaxy Buds+ has a memory for continually storing and processing audio signal from the microphones. The Samsung Galaxy S20 has a memory for storing the audio signal received via a Bluetooth connection from the Samsung Galaxy Buds+. The Samsung Galaxy S20 also has preinstalled software, for example, Samsung's Camera app (with an update of Samsung's One UI 2.5), and this app provides for video recording in Pro Video mode, which enables the setting of a Bluetooth microphone as the audio source for the video.

53. Defendants have had notice of their infringement of the '839 Patent at least since November 5, 2021, the date of filing of the initial complaint in this action.

54. Defendants have indirectly infringed and continue to indirectly infringe the '839 Patent by actively inducing and contributing to the infringement of the '839 Patent by others, such as retailers and users of the Samsung Galaxy S20 and Samsung Galaxy Buds+ within this District.

55. The Accused Products have no substantial non-infringing uses and are a material part of the invention of the '839 Patent. Any manufacture, use, sale, offer for sale, or importation in or into the United States of an Accused Product infringes the '839 Patent. Thus, the Accused Products have no substantial non-infringing uses.

56. Defendants' continued infringement of the '839 Patent has damaged and will continue to damage Plaintiffs.

57. Plaintiffs are entitled to recover damages adequate to compensate for Defendants' infringement.

58. After notice of their infringement of the '839 Patent, Defendants proceeded to make, use, test, sell, and/or offer to sell in this District and elsewhere in the United States, and import into this District and elsewhere in the United States, the Accused Products. Further, Defendants by

disseminating marketing materials, providing user and technical manuals relating to the Accused Products to retailers and users, and by other acts have actively induced infringement by encouraging such third parties to directly infringe the Asserted Patents such as by the retailers selling Accused Products in this District and elsewhere in the United States and by the users of Accused Products using such products in this District and elsewhere in the United States in ways that directly infringe the Asserted Patents. Defendants knew or should have known that the acts they induced constituted patent infringement.

59. On information and belief, Defendants engaged in such activities despite an objectively high likelihood that their actions constituted infringement of valid patents, including the '839 Patent. Defendants knew and should have known that their actions would cause direct and indirect infringement of the '839 Patent.

60. Defendants have willfully infringed and continue to willfully infringe the '839 Patent.

## **COUNT II**

### **Defendants' Infringement of the '591 Patent**

61. Plaintiffs incorporate the allegations of all of the foregoing paragraphs as if fully restated herein.

62. Plaintiff Techiya is the assignee and lawful owner of the '591 Patent and Plaintiffs hold all right, title and interest in and to the '591 Patent. The '591 Patent is valid and enforceable.

63. Defendants have directly infringed, and continue to directly infringe, the '591 Patent by making, using, selling, offering for sale, or importing into the United States products that infringe the '591 Patent including, but not limited to, the Accused Products. Further discovery may reveal additional infringing products and/or models.

64. For example, and without limitation, the Accused Products infringe at least claims 11 and 16 of the ‘591 Patent. The Accused Products fall within the scope of and include, either literally or under the doctrine of equivalents, all of the elements of the asserted claims of the ‘591 Patent.

65. The Samsung Galaxy Buds Pro is an exemplary product covered by at least claims 11 and 16 of the ‘591 Patent. On information and belief, many other products provided by, and to be provided by, Samsung infringe the ‘591 Patent.

66. Claim 11 of the ‘591 Patent claims an earpiece comprising an Ambient Sound Microphone (ASM) configured to capture ambient sound; an Ear Canal Microphone (ECM) configured to capture internal sound in an ear canal; a memory; and a processor operatively coupled to the ASM, the ECM and the memory, where the processor is configured to save a portion of at least one of the captured ambient sound and the captured internal sound in response to an event, wherein the event is a detected sound signature within the ambient sound.

67. The Samsung Galaxy Buds Pro is an earpiece having at least an Ambient Sound Microphone (ASM) configured to capture ambient sound and an Ear Canal Microphone (ECM) configured to capture internal sound in an ear canal. The Samsung Galaxy Buds Pro includes a memory and a processor. The Samsung Galaxy Buds Pro detects an event such as a sound signature for “Hi, Bixby,” and in doing so saves at least temporarily a portion of the ambient sound or the captured internal sound.

68. Claim 16 is a dependent claim based upon independent claim 14. Claim 16 includes an earpiece, comprising: an Ambient Sound Microphone (ASM) configured to capture ambient sound; an Ear Canal Microphone (ECM) configured to capture internal sound in an ear canal; an Ear Canal Receiver (ECR) configured to deliver audio content to the ear canal; a memory; and a processor operatively coupled to the ASM, the ECM, the ECR and the memory, where the processor is

configured to save a portion of at least one of the captured ambient sound, the captured internal sound, and the delivered audio content in response to an event. The event is a touching of the earpiece, a recognizing of a voice command, a starting or ending of a phone call, an abrupt movement of the earpiece, or a scheduled time.

69. The Samsung Galaxy Buds Pro is an earpiece having at least an Ambient Sound Microphone (ASM) configured to capture ambient sound and an Ear Canal Microphone (ECM) configured to capture internal sound in an ear canal. The Samsung Galaxy Buds Pro includes a memory and a processor. A Voice Detect feature of the Samsung Galaxy Buds Pro detects the user's voice with a Voice Pickup Unit sensing an event such as the abrupt movement of the earpiece caused by jaw movement when the user speaks. When the abrupt movement of the earpiece is detected, the processor performs digital signal processing to adjust the gain adjustment of ambient sound and audio content and in doing so the ambient sound and audio signal are stored in the memory at least on a temporary basis.

70. Defendants have had notice of their infringement of the '591 Patent at least since November 5, 2021, the date of filing of the initial complaint in this action.

71. Defendants have indirectly infringed and continue to indirectly infringe the '591 Patent by actively inducing and contributing to the infringement of the '591 Patent by others, such as retailers and users of the Samsung Galaxy Buds Pro within this District.

72. The Accused Products have no substantial non-infringing uses and are a material part of the invention of the '591 Patent. Any manufacture, use, sale, offer for sale, or importation in or into the United States of an Accused Product infringes the '591 Patent. Thus, the Accused Products have no substantial non-infringing uses.



73. Defendants' continued infringement of the '591 Patent has damaged and will continue to damage Plaintiffs.

74. Plaintiffs are entitled to recover damages adequate to compensate for Defendants' infringement.

75. After notice of their infringement of the '591 Patent, Defendants proceeded to make, use, test, sell, and/or offer to sell in this District and elsewhere in the United States, and import into this District and elsewhere in the United States, the Accused Products. Further, Defendants by disseminating marketing materials, providing user and technical manuals relating to the Accused Products, and by other acts have actively induced infringement by encouraging others to directly infringe the Asserted Patents such as by retailers selling Accused Products in this District and elsewhere in the United States and by users of Accused Products using such products in this District and elsewhere in the United States in ways that directly infringe the Asserted Patents. Defendants knew or should have known that the acts they induced constituted patent infringement.

76. On information and belief, Defendants engaged in such activities despite an objectively high likelihood that their actions constituted infringement of valid patents, including the '591 Patent. Defendants knew and should have known that their actions would cause direct and indirect infringement of the '591 Patent.

77. Defendants have willfully infringed and continue to willfully infringe the '591 Patent.

### **COUNT III**

#### **Defendants' Infringement of the '400 Patent**

78. Plaintiffs incorporate the allegations of all of the foregoing paragraphs as if fully restated herein.

79. Plaintiff Techiya is the assignee and lawful owner of the ‘400 Patent, and Plaintiffs hold all right, title and interest in and to the ‘400 Patent. The ‘400 Patent is valid and enforceable.

80. Defendants have directly infringed and continue to directly infringe the ‘400 Patent by making, using, selling, offering for sale, or importing into the United States products that infringe the ‘400 Patent including, but not limited to, the Accused Products. Further discovery may reveal additional infringing products and/or models.

81. For example, and without limitation, the Accused Products infringe at least claim 14 of the ‘400 Patent. The Accused Products fall within the scope of and include, either literally or under the doctrine of equivalents, all of the elements of the asserted claims of the ‘400 Patent.

82. The Samsung Galaxy Buds is an exemplary product covered by at least claim 14 of the ‘400 Patent. On information and belief, many other products provided by, and to be provided by, Samsung infringe the ‘400 Patent.

83. The ‘400 Patent claims a method for acoustic management control comprising the steps of: providing an acoustic barrier to an ear canal of a user; capturing an ambient sound from at least one Ambient Sound Microphone (ASM) to produce an ambient sound signal that includes an external voice signal of the user; capturing in the ear canal of the user an internal sound from the at least one Ear Canal Microphone (ECM) to produce an internal sound signal that includes an internal voice signal of the user; determining a background noise signal from at least one of the ambient sound signal or the internal sound signal; and adjusting an amplitude of one or more frequencies of the internal sound signal and the ambient sound signal based on the background noise signal, to filter the internal sound signal relative to the ambient sound signal.

84. The Samsung Galaxy Buds is an earpiece that when inserted in the ear of a user provides an acoustic barrier to an ear canal of the user. The earpiece includes at least one Ambient

Sound Microphone (ASM) for capturing an ambient sound and for producing an ambient sound signal that includes an external voice signal of the user. The earpiece also includes at least one Ear Canal Microphone (ECM). The ECM captures in the ear canal of the user an internal sound to produce an internal sound signal that includes an internal voice signal of the user. The Adaptive Dual-Microphone technology of the Samsung Galaxy Buds senses ambient noise levels. The earpiece of the Samsung Galaxy Buds includes a processor and other circuitry that determines a background or ambient noise signal from at least one of the ambient sound signal or the internal sound signal; and adjusts the amplitude of one or more frequencies of the internal sound signal and the ambient sound signal based on the background noise signal, to filter the internal sound signal relative to the ambient sound signal.

85. Defendants have had notice of their infringement of the '400 Patent at least since November 5, 2021, the date of filing of the initial complaint in this action.

86. Defendants have indirectly infringed and continue to indirectly infringe the '400 Patent by actively inducing and contributing to the infringement of the '400 Patent by others, such as users of the Samsung Galaxy Buds within this District.

87. The Accused Products have no substantial non-infringing uses and are a material part of the invention of the '400 Patent. Any use of an Accused Product infringes the '400 Patent. Thus, the Accused Products have no substantial non-infringing uses.

88. Defendants continued infringement of the '400 Patent has damaged and will continue to damage Plaintiffs.

89. Plaintiffs are entitled to recover damages adequate to compensate for Defendants' infringement.

90. After notice of their infringement of the '400 Patent, Defendants proceeded to make, use, test, sell, and/or offer to sell in this District and elsewhere in the United States, and import into this District and elsewhere in the United States, the Accused Products. Further, Defendants by disseminating marketing materials, providing user and technical manuals relating to the Accused Products, and by other acts have actively induced infringement by encouraging others to directly infringe the Asserted Patents such as by retailers selling Accused Products in this District and elsewhere in the United States and by users of Accused Products using such products in this District and elsewhere in the United States in ways that directly infringe the Asserted Patents. Defendants knew or should have known that the acts they induced constituted patent infringement.

91. On information and belief, Defendants engaged in such activities despite an objectively high likelihood that their actions constituted infringement of valid patents, including the '400 Patent. Defendants knew and should have known that their actions would cause direct and indirect infringement of the '400 Patent.

92. Defendants have willfully infringed and continue to willfully infringe the '400 Patent.

#### **COUNT IV**

##### **Defendants' Infringement of the '982 Patent**

93. Plaintiffs incorporate the allegations of all of the foregoing paragraphs as if fully restated herein.

94. Plaintiff Techiya is the assignee and lawful owner of the '982 Patent and Plaintiffs hold all right, title and interest in and to the '982 Patent. The '982 Patent is valid and enforceable.

95. Defendants have directly infringed, and continue to directly infringe, the '982 Patent by making, using, selling, offering for sale, or importing into the United States products that infringe

the '982 Patent including, but not limited to, the Accused Products. Further discovery may reveal additional infringing products and/or models.

96. For example, and without limitation, the Accused Products infringe at least claim 2 of the '982 Patent. The Accused Products fall within the scope of and include, either literally or under the doctrine of equivalents, all of the elements of the asserted claims of the '982 Patent.

97. The Bixby-enabled Samsung Galaxy S20 and other Bixby-enabled Samsung Galaxy smartphones are exemplary products covered by at least claim 2 of the '982 Patent. On information and belief, many other products provided by, and to be provided by, Samsung infringe the '982 Patent.

98. Claim 2 of the '982 patent is a dependent claim based upon independent claim 1 and includes the claim elements of claim 1 and claim 2. In combination these elements recite an Always-On Recording System (AORS) comprising a monitoring assembly mounted on a mobile phone, the monitoring assembly including an ambient sound microphone (ASM) to monitor an ambient acoustic field proximate to the mobile phone, the ASM producing an ASM signal responsive to the ambient acoustic field; a data storage device configured to act as a circular buffer for continually storing the ASM signal; a further data storage device coupled to the data storage device; and a record-activation system including software configured to activate the further data storage device to record a content of the data storage device. In the system the record-activation system is configured to activate the further data storage device responsive to detection of at least one of a speech sound, a non-speech sound or a transient sound in the content of the data storage device.

99. The Bixby-enabled Samsung Galaxy S20 and other Bixby-enabled Samsung Galaxy smartphones include a High AOP Microphone which serves as an ambient sound microphone (ASM) to monitor an ambient acoustic field proximate to the mobile phone. The High AOP Microphone produces a signal responsive to the ambient acoustic field of the Samsung Galaxy S20.

100. In the Samsung Galaxy S20, the Bixby platform can be voice-activated by the user speaking a command or phrase such as “Hi, Bixby.” In order not to miss the activation message (e.g., “Hi, Bixby!”) the Samsung Galaxy S20 continually records at least temporarily the output signal of the AOP microphone signal in a memory functioning as a circular buffer and analyzes the recorded signal to detect the activation message. On information and belief, the memory is located in a Qualcomm Snapdragon processor or other component, which also analyzes the stored microphone output to detect the activation phrase.

101. More specifically, in order to detect the activation message (i.e., “Hi, Bixby!”) the Samsung Galaxy S20 monitors what the smartphone user says by continually recording the microphone signal at least temporarily and analyzing the recorded signal to know whether or not the activation message is said. Thus, a portion of the memory in the Qualcomm Snapdragon processor of the Samsung Galaxy S20 is a data storage device configured as a circular buffer and the processor performs audio signal processing to recognize the activation message. The Samsung Galaxy S20 also includes a flash memory, which comprises a further data storage device coupled to the data storage device.

102. The Samsung Galaxy S20 provides a pre-installed Samsung Voice Recorder app for recording voice or converting recorded voice into text. Samsung Voice Recorder is designed to provide the user with the capability to record with high quality sound and to offer playback and editing capabilities. Samsung Voice Recorder app is configured to activate the further data storage device to record the content of the data storage device. Recording with the Samsung Voice Recorder app can be initiated by a Bixby voice command.

*Source:* <https://www.samsung.com/us/explore/bixby/>

103. Defendants have had notice of their infringement of the '982 Patent at least since November 5, 2021, the date of filing of the initial complaint in this action.

104. Defendants have indirectly infringed and continue to indirectly infringe the '982 Patent by actively inducing and contributing to the infringement of the '982 Patent by others, such as users of the Bixby and the Samsung Galaxy S20 within this District.

105. The Accused Products have no substantial non-infringing uses and are a material part of the invention of the '982 Patent. Any use of an Accused Product infringes the '982 Patent. Thus, the Accused Products have no substantial non-infringing uses.

106. Defendants continued indirect infringement of the '982 Patent has damaged and will continue to damage Plaintiffs.

107. Plaintiffs are entitled to recover damages adequate to compensate for Defendants' infringement.

108. After notice of their infringement of the of the '982 Patent, Defendants proceeded to make, use, test, sell, and/or offer to sell in this District and elsewhere in the United States, and import into this District and elsewhere in the United States, the Accused Products. Further, Defendants by disseminating marketing materials, providing user and technical manuals relating to the Accused Products, and by other acts have actively induced infringement by encouraging others to directly infringe the Asserted Patents such as by retailers selling Accused Products in this District and elsewhere in the United States and by users of Accused Products using such products in this District and elsewhere in the United States in ways that directly infringe the Asserted Patents. Defendants knew or should have known that the acts they induced constituted patent infringement.

109. On information and belief, Defendants engaged in such activities despite an objectively high likelihood that their actions constituted infringement of valid patents, including the ‘982 Patent. Defendants knew and should have known that their actions would cause direct and indirect infringement of the ‘982 Patent.

110. Defendants have willfully infringed and continue to willfully infringe the ‘982 Patent.

### **COUNT V**

#### **Defendants' Infringement of the ‘542 Patent**

111. Plaintiffs incorporate the allegations of all of the foregoing paragraphs as if fully restated herein.

112. Plaintiff Techiya is the assignee and lawful owner of the ‘542 Patent, and Plaintiffs hold all right, title and interest in and to the ‘542 Patent. The ‘542 Patent is valid and enforceable.

113. Defendants have directly infringed, and continue to directly infringe, the ‘542 Patent by making, using, selling, offering for sale, or importing into the United States products that infringe the ‘542 Patent including, but not limited to, the Accused Products. Further discovery may reveal additional infringing products and/or models.

114. For example, and without limitation, the Accused Products infringe at least claim 1 of the ‘542 Patent. The Accused Products practice methods that fall within the scope of and include, either literally or under the doctrine of equivalents, all of the steps of at least claim 1 of the ‘542 Patent.

115. The Samsung Galaxy Buds Pro is an exemplary product that practices the method covered by at least claim 1 of the ‘542 Patent. On information and belief, many other products provided by, and to be provided by, Samsung practice method claimed in the ‘542 Patent.



116. The '542 Patent claims a method for passing ambient sound to an earphone device configured to be inserted in an ear canal of a user, the method comprising the steps of: capturing the ambient sound from an ambient sound microphone (ASM) proximate to the earphone device to form an ASM signal; receiving an audio content (AC) signal from a remote device; detecting voice activity of the user of the earphone device; mixing the ASM signal and the AC signal to form a mixed signal, such that, in the mixed signal, an ASM gain of the ASM signal is increased and an AC gain of the AC signal is decreased when the voice activity is detected; detecting a cessation of the voice activity; delaying modification of the ASM gain and the AC gain for a predetermined time period responsive to the detected cessation of the voice activity; and directing the mixed signal to an ear canal receiver (ECR) of the earphone device.

117. The Samsung Galaxy Buds Pro includes a two way speaker and at least three microphones: a main microphone with high SNR (signal-to-noise ratio) (the ASM or ambient sound microphone), a sub microphone, and an inner (ear canal) microphone. The Buds Pro further includes the BCM 43015 chipset controlled by the RTOS operating system. A processor within a chipset and the ASM are communicatively coupled to monitor ambient sound. At least the ASM microphone monitors ambient sound. At least one of the other microphones is located in the ear canal. Samsung Galaxy Buds Pro receives an audio content signal (e.g., music) from a remote device (e.g., smartphone) via Bluetooth.

*Source:* <https://www.samsung.com/global/galaxy/galaxy-buds-pro/specs/>

118. The audio content delivered to the Samsung Galaxy Buds Pro can be music content or music contents associated with a video clip. Voice Detect in the Samsung Galaxy Buds Pro instantly switches from ANC to Ambient Sound mode when the user's voice is detected. A timer can be set to control the delay in returning to the previous audio state when no voice activity has been detected

within a settable period. The user can set the duration of the timer among 5 seconds, 10 seconds, and 15 seconds.

*Source:* <https://www.samsung.com/us/mobile/audio/galaxy-buds-pro/>

119. The Voice Detect feature of the Samsung Galaxy Buds Pro first detects the user's voice before switching from ANC to Ambient sound. When the user's voice is detected on ANC, Ambient sound is turned on (i.e., ASM gain is increased) and music volume is lowered (i.e., AC gain is decreased).

*Source:* <https://www.samsung.com/ca/support/mobile-devices/experience-noise-controls-mode-on-your-galaxy-buds-pro/>

120. After a switch to Ambient sound, if there is no voice detected (i.e., cessation of the voice activity), Samsung Galaxy Buds Pro does not immediately switch back to the previous mode. Instead, it delays the modification of the ASM gain and the AC gain back to the previous state by starting a timer upon detecting cessation of the voice activity. Voice Detect in the Samsung Galaxy Buds Pro instantly switches from ANC to Ambient Sound mode when a voice is detected. A timer can be set to control the delay in returning to previous audio state when no voice activity has been detected within a settable period. The user can set the duration of the timer among 5 seconds, 10 seconds, and 15 seconds. The mixed signal is delivered to a speaker in the ear canal.

*Source:* <https://www.samsung.com/us/mobile/audio/galaxy-buds-pro/>

121. Defendants have had notice of their infringement of the '542 Patent at least since November 5, 2021, the date of filing of the initial complaint in this action.

122. Defendants have indirectly infringed and continue to indirectly infringe the '542 Patent by actively inducing and contributing to the infringement of the '542 Patent by others, such as users of the Samsung Galaxy Buds Pro within this District.

123. The Accused Products have no substantial non-infringing uses and are a material part of the invention of the '542 Patent. Any use of an Accused Product infringes the '542 Patent. Thus, the Accused Products have no substantial non-infringing uses.

124. Defendants continued infringement of the '542 Patent has damaged and will continue to damage Plaintiffs.

125. Plaintiffs are entitled to recover damages adequate to compensate it for Defendants' infringement.

126. After notice of their infringement of the '542 Patent, Defendants proceeded to make, use, test, sell, and/or offer to sell in this District and elsewhere in the United States, and import into this District and elsewhere in the United States, the Accused Products. Further, Defendants by disseminating marketing materials, providing user and technical manuals relating to the Accused Products, and by other acts have actively induced infringement by encouraging others to directly infringe the Asserted Patents such as by retailers selling Accused Products in this District and elsewhere in the United States and by users of Accused Products using such products in this District and elsewhere in the United States in ways that directly infringe the Asserted Patents. Defendants knew or should have known that the acts they induced constituted patent infringement.

127. On information and belief, Defendants engaged in such activities despite an objectively high likelihood that their actions constituted infringement of the '542 Patent. Defendants knew and should have known that their actions would cause direct and induced infringement of the '542 Patent.

128. Defendants have willfully infringed and continue to willfully infringe the '542 Patent.

## **COUNT VI**

### **Defendants' Infringement of the '244 Patent**

129. Plaintiffs incorporate the allegations of all of the foregoing paragraphs as if fully restated herein.

130. Plaintiff Techiya is the assignee and lawful owner of the '244 Patent and Plaintiffs hold all right, title and interest in and to the '244 Patent. The '244 Patent is valid and enforceable.

131. Defendants have directly infringed, and continue to directly infringe, the '244 Patent by making, using, selling, offering for sale, or importing into the United States products that in operation infringe the '244 Patent including, but not limited to, the Accused Products. Further discovery may reveal additional infringing products and/or models.

132. For example, and without limitation, the Accused Products infringe at least claim 1 of the '244 Patent. The methods practiced by the Accused Products fall within the scope of and include, either literally or under the doctrine of equivalents, all of the elements of the asserted claims of the '244 Patent.

133. The Samsung Galaxy Buds Pro is an exemplary product that practices the method covered by at least claim 1 of the '244 Patent. On information and belief, many other products provided by, and to be provided by, Samsung practice claims in the '244 Patent.

134. The '244 Patent claims a method for close proximity detection and automatic audio mixing performed by a processor suitable for use with an earphone. The method comprises the steps of monitoring sound from an ambient sound microphone communicatively coupled to the processor; automatically activating a voice timer responsive to detecting voice activity or a cessation of voice activity in the sound as part of the close proximity detection; adjusting a mixing gain of an audio content signal delivered to the earphone with the ambient sound pass-through during a voice timer

pending voice activity; and wherein the audio content is one of a voice signal, music content, or audible sound delivered to the internal speaker for audible reproduction.

135. The Buds Pro further includes the BCM 43015 chipset, including a processor, controlled by the RTOS operating system. The Buds Pro includes a two way speaker and at least three microphones: a main microphone with high SNR (signal-to-noise ratio) (the ASM or ambient sound microphone), a sub microphone, and an inner (ear canal) microphone. A processor with the chipset and the ASM are communicatively coupled to monitor ambient sound.

*Source:* <https://www.samsung.com/global/galaxy/galaxy-buds-pro/specs/>

136. The audio content delivered to the Samsung Galaxy Buds Pro can be, for example, music content, including music content associated with a video clip. Voice Detect in the Samsung Galaxy Buds Pro instantly monitors the beginning and cessation of voice content and switches from ANC to Ambient Sound mode when the user's voice is detected. A timer can be set to control the delay in returning to previous audio state when no voice activity has been detected within a settable period. The user can set the duration of the timer among 5 seconds, 10 seconds, and 15 seconds.

*Source:* <https://www.samsung.com/us/mobile/audio/galaxy-buds-pro/>

137. The Voice Detect has a timer which is automatically activated for switching back to the previous noise control and sound settings from Ambient sound pass-through if no voice is detected (i.e., cessation of voice activity) for the duration set by the timer. Before the timer expires (i.e., during a voice timer pending voice activity), the Samsung Galaxy Buds Pro remains in the Ambient sound mode to adjust the mixing gain of an audio content signal delivered to the earphone with the ambient sound pass-through during a voice timer pending voice activity. The audio content is one of a voice signal, music content, or audible sound delivered to the internal speaker for audible reproduction.

*Source:* <https://www.samsung.com/global/galaxy/events/unpacked/>

138. Defendants have had notice of their infringement of the '244 Patent since at least as early as November 5, 2021, the date of filing of the initial complaint in this action.

139. Defendants have indirectly infringed and continue to indirectly infringe the '244 Patent by actively inducing and contributing to the infringement of the '244 Patent by others, such as users of the Samsung Galaxy Buds Pro within this District.

140. The Accused Products have no substantial non-infringing uses and are a material part of the invention of the '244 Patent. Any use of an Accused Product infringes the '244 Patent. Thus, the Accused Products have no substantial non-infringing uses.

141. After notice of their infringement of the '244 Patent, Defendants continued infringement of the '244 Patent which has damaged and will continue to damage Plaintiffs.

142. Plaintiffs are entitled to recover damages adequate to compensate it for Defendants' infringement.

143. After notice of their infringement of the '244 Patent, Defendants proceeded to make, use, test, sell, and/or offer to sell in this District and elsewhere in the United States, and import into this District and elsewhere in the United States, the Accused Products. Further, Defendants by disseminating marketing materials, providing user and technical manuals relating to the Accused Products, and by other acts have actively induced infringement by encouraging others to directly infringe the Asserted Patents such as by retailers selling Accused Products in this District and elsewhere in the United States and by users of Accused Products using such products in this District and elsewhere in the United States in ways that directly infringe the Asserted Patents. Defendants knew or should have known that the acts they induced constituted patent infringement.

144. On information and belief, Defendants engaged in such activities despite an objectively high likelihood that their actions constituted infringement of valid patents, including the ‘244 Patent. Defendants knew and should have known that their actions would cause direct and indirect infringement of the ‘244 Patent.

145. Defendants have willfully infringed and continue to willfully infringe the ‘244 Patent.

## **COUNT VII**

### **Defendants' Infringement of the ‘082 Patent**

146. Plaintiffs incorporate the allegations of all of the foregoing paragraphs as if fully restated herein.

147. Plaintiff Techiya is the assignee and lawful owner of the ‘082 Patent and Plaintiffs hold all right, title and interest in and to the ‘082 Patent. The ‘082 Patent is valid and enforceable.

148. Defendants have directly infringed, and continue to directly infringe, the ‘082 Patent by making, using, selling, offering for sale, or importing into the United States products that infringe the ‘082 Patent including, but not limited to, the Accused Products. Further discovery may reveal additional infringing products and/or models.

149. For example, and without limitation, the Accused Products infringe at least claim 14 of the ‘082 Patent. The Accused Products fall within the scope of and include, either literally or under the doctrine of equivalents, all of the elements of the asserted claims of the ‘082 Patent.

150. The Bixby-enabled Samsung Galaxy S20 and other Bixby-enabled Samsung Galaxy smartphones are exemplary products covered by at least claim 14 of the ‘082 Patent. On information and belief, many other products provided by, and to be provided by, Samsung infringe the ‘082 Patent.

151. Claim 14 of the ‘082 Patent is directed to a device capable of receiving and identifying acoustic keywords comprising: a microphone; a processor; and processor readable memory, where

acoustic characteristics of at least five verbal keywords are stored in the processor readable memory, where the processor is configured to identify an acoustic keyword signal by comparing the acoustic characteristics of the at least five verbal keywords to an acoustic signal sent from the microphone, wherein the acoustic keyword signal is identified in the acoustic signal when temporal or spectral patterns of at least one of the five verbal keywords and the acoustic signal match within a threshold average value, where the processor has been configured to initiate at least one of the following based upon the keyword identified: initiate a phone call; initiate an increase gain to the acoustic signal; and initiate a decrease gain to the acoustic signal.

152. The Bixby-enabled Samsung Galaxy S20 and other Bixby-enabled Samsung Galaxy smartphones include a High AOP Microphone which serves as an ambient sound microphone (ASM) to monitor an ambient acoustic field proximate to the mobile phone. The High AOP Microphone produces a signal responsive to the ambient acoustic field of the Samsung Galaxy S20. On information and belief, the Samsung Galaxy S20 includes a Snapdragon 865 processor, 12 GB of LPDDR5 RAM, 128 GB of flash storage, and four cameras.

*Source: [Samsung Galaxy S20 Ultra Teardown \(ifixit-guide-pdfs.s3.amazonaws.com/pdf/ifixit/guide\\_131607\\_en.pdf\)](https://www.ifixit.com/Document/Teardown/Samsung-Galaxy-S20-Teardown)*

153. The Samsung Galaxy Buds Live and other Samsung earphones include ambient and ear canal microphones. [https://www.bhphotovideo.com/lit\\_files/621703.pdf](https://www.bhphotovideo.com/lit_files/621703.pdf)

154. The Bixby platform includes at least one server that includes at least one processor and processor readable memory where acoustic characteristics of at least five verbal keywords are stored.

155. In order for the Bixby platform to detect and understand a user's voice commands, the Bixby platform performs speech recognition and natural language analysis. The speech recognition requires comparing known information, i.e., the stored temporal or spectral acoustic characteristics of



words, with unknown information, i.e., similar characteristics of an acoustic signal from the microphone of the Samsung Galaxy S20 or Samsung Galaxy Buds Live.

Bixby, Samsung Electronics' intelligent voice assistant, is available in nine languages and on more than 160 million devices globally. Earlier this year, Samsung Electronics developed a new end-to-end (E2E) automatic speech recognition (ASR) engine for Bixby. The new ASR engine, based on the Transformer neural network architecture, simplified the training process, but also required more training data. Rapid training for the machine learning model became critical to maintaining Bixby as more languages were introduced to the service. To address this, Samsung Electronics chose to adopt Cloud TPUs to meet and exceed performance requirements for Bixby.

*Source:* <https://www.finchannel.com/technology/79646-google-s-cloud-tpus-increase-samsung-electronics-bixby-s-ai-model-training-speed-by-18x>

156. The Bixby platform can find and initiate calls to phone numbers in the address book of the Samsung Galaxy S20 and other similar Samsung smartphones.

*Source:* <https://www.samsung.com/us/explore/bixby/>

157. On information and belief, the processor of the Bixby server is configured to identify an acoustic keyword signal by comparing known acoustic characteristics of the at least five verbal keywords stored in the memory of the Bixby server to an acoustic signal sent from the of the microphone of the Samsung Galaxy S20 or the Samsung Galaxy Buds Live. As a result of such comparison the acoustic keyword signal is identified from the temporal or spectral patterns of at least one of the five verbal keywords and those of the acoustic signal match within a threshold average value.

158. Upon information and belief, the processor in the Samsung Galaxy S20 is configured to initiate a phone call based upon the keyword identified.

159. Defendants have had notice of their infringement of the '082 Patent since at least November 5, 2021, the date of filing of the initial complaint in this action.

160. The Accused Products have no substantial non-infringing uses and are a material part of the invention claimed in the '082 Patent. Any use of an Accused Product infringes the '082 Patent. Thus, the Accused Products have no substantial non-infringing uses.

161. Defendants continued indirect infringement of the '082 Patent has damaged and will continue to damage Plaintiffs.

162. Plaintiffs are entitled to recover damages adequate to compensate for Defendants' infringement.

163. After notice of their infringement of the '082 Patent, Defendants proceeded to make, use, test, sell, and/or offer to sell in this District and elsewhere in the United States, and import into this District and elsewhere in the United States, the Accused Products. Further, Defendants by disseminating marketing materials, providing user and technical manuals relating to the Accused Products, and by other acts have actively induced infringement by encouraging others to directly infringe the Asserted Patents such as by retailers selling Accused Products in this District and elsewhere in the United States and by users of Accused Products using such products in this District and elsewhere in the United States in ways that directly infringe the Asserted Patents. Defendants knew or should have known that the acts they induced constituted patent infringement.

164. On information and belief, Defendants engaged in such activities despite an objectively high likelihood that their actions constituted infringement of the '082 Patent. Defendants

knew and should have known that their actions would cause direct and indirect infringement of the '082 Patent.

165. Defendants have willfully infringed and continue to willfully infringe the '082 Patent.

### **COUNT VIII**

#### **Defendants' Infringement of the '015 Patent**

166. Plaintiffs incorporate the allegations of all of the foregoing paragraphs as if fully restated herein.

167. Plaintiff Techiya is the assignee and lawful owner of the '015 Patent and Plaintiffs hold all right, title and interest in and to the '015 Patent. The '015 Patent is valid and enforceable.

168. Defendants have directly infringed and continue to directly infringe the '015 patent and have induced infringement of and continue to induce infringement of the '015 Patent by making, using, selling, offering for sale, or importing into the United States products that in operation infringe the '015 Patent including, but not limited to, the Accused Products. Further discovery may reveal additional infringing products and/or models.

169. For example, and without limitation, the Accused Products infringe at least claim 1 of the '015 Patent. The operation of the Accused Products falls within the scope of and include, either literally or under the doctrine of equivalents, all of the elements of the asserted claims of the '015 Patent.

170. The Samsung earphone products supporting the Bixby platform and Ambient sound mode, including the Samsung Galaxy Buds, Buds+, Buds Pro, and the Bixby Platform are exemplary products covered by at least claim 1 of the '015 Patent. On information and belief, many other products provided by, and to be provided by, Samsung infringe the '015 Patent.

171. Claim 1 of the '015 Patent is directed to a method for activating ambient sound pass-through in an earphone in response to a detected keyword in the ambient sound field of the earphone user, the steps of the method comprising: receiving at least one ambient sound microphone (ASM) signal; receiving at least one audio content (AC) signal; identifying if a keyword is matched to a portion of the ASM signal, wherein the keyword is matched to the portion of the ASM signal when temporal or spectral patterns of the keyword and the portion of the ASM signal match within a threshold average value; and generating an ASM gain if a keyword is matched to the portion of the ASM signal; and applying the ASM gain to the ASM signal until a new keyword is detected or manually adjusted.

172. The Bixby-enabled Samsung Galaxy Buds, Buds+, and Buds Pro include Ambient Sound Mode in which the gain of the signal from an Ambient sound Microphone is increased to enable the user of the Buds to better hear ambient sound when also listening to music or other sound.

### **Use Ambient sound on your Samsung earbuds**

#### **Galaxy Buds Pro**

Ambient sound can be used on your Galaxy Buds Pro when you need to hear what's going on around you. You can also use the new Detect conversations feature to easily hear if someone is speaking to you...

#### **Galaxy Buds+**

Note: Ambient sound is only available when the Buds+ are connected to the Galaxy Wearable app on Android devices or the Buds app on an iPhone 7 or later with iOS 10 or higher.

Ambient sound lets noise from your surroundings flow into your earbuds, so you can keep your ears open to what's going on in the world around you...

### **Galaxy Buds**

When you need to be aware of your surroundings, turn on Ambient sound.

Remember to also adjust your earbuds for a comfortable fit.

*Source:* <https://www.samsung.com/us/support/answer/ANS00078084/>

173. In order for the Bixby platform to detect and understand a user's voice commands, the Bixby platform performs speech recognition and natural language analysis. The speech recognition requires comparing known information, i.e., the stored temporal or spectral acoustic characteristics of words, with unknown information, i.e., similar characteristics of an acoustic signal from the microphone of Bixby-enabled Galaxy smartphones or ear buds such as Galaxy Buds, Buds+, and Buds Pro.

*Source:* <https://www.finchannel.com/technology/79646-google-s-cloud-tpus-increase-samsung-electronics-bixby-s-ai-model-training-speed-by-18x>

174. The Samsung Galaxy Buds, Buds+, and Buds Pro receive ambient sound microphone (ASM) signal from an outer microphone.

175. The Samsung Galaxy Buds, Buds+, and Buds Pro receive audio content (AC) signals such as speech from a phone call or music audio from a mobile device via Bluetooth technology.

176. The Bixby functionality on Samsung Galaxy Buds, Buds+, and Buds Pro the identifies if a keyword is matched to a portion of the ASM signal by matching temporal or spectral patterns of a known keyword and to a portion of the ASM signal within a threshold average value.

177. The Samsung Galaxy Buds, Buds+, and Buds Pro generate an ASM gain if a keyword initiating Ambient Sound Mode is matched to the portion of the ASM signal to increase the level of ambient sound into the earbuds.

178. The Ambient sound mode continues until the user turns it off manually or by a voice command such that the ASM gain to the ASM signal continues until a new keyword is detected or there is manual adjustment.

179. Defendants have had notice of their infringement of the '015 Patent since at least November 5, 2021, the date of filing of the initial complaint in this action.

180. The Accused Products have no substantial non-infringing uses and are a material part of the invention of the '015 Patent. Any use of an Accused Product infringes the '015 Patent. Thus, the Accused Products have no substantial non-infringing uses.

181. Defendants continued to infringe and to induce infringement of the '015 Patent which has damaged and will continue to damage Plaintiffs.

182. Plaintiffs are entitled to recover damages adequate to compensate for Defendants' infringement.

183. After notice of their infringement of the '015 Patent, Defendants proceeded to make, use, test, sell, and/or offer to sell in this District and elsewhere in the United States, and import into this District and elsewhere in the United States, the Accused Products. Further, Defendants by disseminating marketing materials, providing user and technical manuals relating to the Accused Products, and by other acts have actively induced infringement by encouraging others to directly infringe the Asserted Patents such as by retailers selling Accused Products in this District and elsewhere in the United States and by users of Accused Products using such products in this District and elsewhere in the United States in ways that directly infringe the Asserted Patents.

Defendants knew or should have known that the acts they induced constituted patent infringement.

184. On information and belief, Defendants engaged in such activities despite an objectively high likelihood that their actions constituted infringement of the '015 Patent. Defendants knew and should have known that their actions would cause direct and indirect infringement of the '015 Patent.

185. Defendants have willfully infringed and continue to willfully infringe the '015 Patent.

### **COUNT IX**

#### **Defendants' Infringement of the '424 Patent**

186. Plaintiffs incorporate the allegations of all of the foregoing paragraphs as if fully restated herein.

187. Plaintiff Techiya is the assignee and lawful owner of the '424 Patent and Plaintiffs hold all right, title and interest in and to the '424 Patent. The '424 Patent is valid and enforceable.

188. Defendants have directly infringed, and continue to directly infringe, the '424 Patent by making, using, selling, offering for sale, or importing into the United States products that infringe the '424 Patent including, but not limited to, the Accused Products. Further discovery may reveal additional infringing products and/or models.

189. For example, and without limitation, the Accused Products infringe at least claim 1 of the '424 Patent. The Accused Products fall within the scope of and include, either literally or under the doctrine of equivalents, all of the elements of the asserted claims of the '424 Patent.

190. The Samsung Galaxy Buds 2 is an exemplary product covered by at least claim 1 of the '424 Patent. On information and belief, many other products provided by, and to be provided by, Samsung infringe the '424 Patent.

191. Claim 1 of the '424 Patent claims an electronic audio device for use with at least one earpiece or a pair of earpieces, or a pair of earpieces in a headphone, each earpiece having a microphone operatively coupled to the earpiece and a speaker located therein, comprising: circuitry operatively coupled to the microphone and speaker; a processor operatively coupled to evaluate a seal quality of the earpiece based on seal quality measurements made while driving or exciting a signal into the speaker located in the earpiece; and wherein the processor is configured to generate a visual or audio message identifying whether the at least one earpiece is properly sealed based on the seal quality measurements.

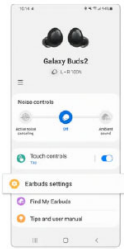
192. The Samsung Galaxy Buds 2 is an earpiece having at least an Ambient Sound Microphone (ASM) configured to capture ambient sound and an Ear Canal Microphone (ECM) configured to capture internal sound in an ear canal. The Samsung Galaxy Buds 2 includes a speaker for delivering sound to the ear canal of a user.

193. The fit of the earpieces of the Samsung Galaxy Buds 2 in the ear of a user can be evaluated and the results can be provided to a user.

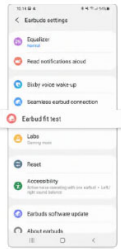
## **If you're not sure about the fit, try the Galaxy Earbud fit test**

You can use the Galaxy **Earbud fit test** if you're not sure that you're getting the best possible sound quality and active noise cancelling. In the Galaxy **Earbud fit test**, while wearing the Galaxy Buds2, speakers in the earbuds emit a chime sound into the ear to detect and calculate bouncing sound that escapes through your earbuds for any sound loss. An ear tip showing the least sound loss would be recommended as best fit. Follow the steps below to test your ear buds.





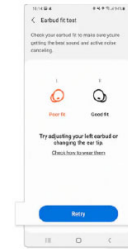
**Step 1.** Launch the **Galaxy Wearable** app on your mobile device and tap **Earbuds settings**.



**Step 2.** Tap **Earbud fit test**.



**Step 3.** Wear both earbuds in your ears, and then tap **Start**. The earbuds will emit a sound and the test will begin.



**Step 4.** If the results on the screen say you need to adjust your earbuds, try adjusting your earbuds or changing the ear tips, and tap **Retry** to start the test again.

*Source:* <https://www.samsung.com/sg/support/mobile-devices/find-the-best-fit-for-your-ears-with-the-galaxy-earbud-fit-test/>

194. The Samsung Galaxy Buds 2 has a pair of earpieces wherein each earpiece has a microphone and also has a speaker to be located in the ear canal of a user. The Samsung Galaxy Buds 2 includes circuitry operatively coupled to the microphone and speaker to, for example, provide signals for the speaker to generate a chime sound. The microphone receives the chime sound. The processor of the Samsung Galaxy Buds 2 evaluates the output of the microphone and determines the seal quality of the earpiece based upon the quality of the chime sound picked up by the microphone. The processor is configured to generate signals to provide a visual or audio message identifying whether the earpiece is properly sealed based on the seal quality measurements.

195. Defendants have had notice of their infringement of the '424 Patent since at least November 5, 2021, the date of filing of the initial complaint in this action.

196. Defendants have, and continue to, indirectly infringe the '424 Patent by actively inducing and contributing to the infringement of the '424 Patent by others, such as retailers and users of the Samsung Galaxy Buds 2 within this District.

197. The Accused Products have no substantial non-infringing uses and are a material part of the invention of the '424 Patent. Any manufacture, use, sale, offer for sale, or importation in or into the United States of an Accused Product infringes the '424 Patent. Thus, the Accused Products have no substantial non-infringing uses.

198. Defendants' continued infringement of the '424 Patent has damaged and will continue to damage Plaintiffs.

199. Plaintiffs are entitled to recover damages adequate to compensate for Defendants' infringement.

200. After notice of their infringement of the '424 Patent, Defendants proceeded to make, use, test, sell, and/or offer to sell in this District and elsewhere in the United States, and import into this District and elsewhere in the United States, the Accused Products. Further, Defendants by disseminating marketing materials, providing user and technical manuals relating to the Accused Products, and by other acts have actively induced infringement by encouraging others to directly infringe the Asserted Patents such as by retailers selling Accused Products in this District and elsewhere in the United States and by users of Accused Products using such products in this District and elsewhere in the United States in ways that directly infringe the Asserted Patents. Defendants knew or should have known that the acts they induced constituted patent infringement.

201. On information and belief, Defendants engaged in such activities despite an objectively high likelihood that their actions constituted infringement of the '424 Patent. Defendants knew and should have known that their actions would cause direct and indirect infringement of the '424 Patent.

202. Defendants have willfully infringed and continue to willfully infringe the '424 Patent.

**COUNT X**

**Defendants' Infringement of the '836 Patent**

203. Plaintiffs incorporate the allegations of all of the foregoing paragraphs as if fully restated herein.

204. Plaintiff Techiya is the assignee and lawful owner of the '836 Patent and Plaintiffs hold all right, title and interest in and to the '836 Patent. The '836 Patent is valid and enforceable.

205. Defendants have directly infringed, and continue to directly infringe, the '836 Patent by making, using, selling, offering for sale, or importing into the United States products that infringe the '836 Patent including, but not limited to, the Accused Products. Further discovery may reveal additional infringing products and/or models.

206. For example, and without limitation, the Accused Products infringe at least claim 9 of the '836 Patent. The Accused Products fall within the scope of and include, either literally or under the doctrine of equivalents, all of the elements of the asserted claims of the '836 Patent.

207. The Samsung Galaxy Buds 2 is an exemplary product covered by at least claim 9 of the '836 Patent. On information and belief, many other products provided by, and to be provided by, Samsung infringe the '836 Patent.

208. Claim 9 of the '836 Patent claims an earphone configured to perform an eartip fit test comprising: a first microphone, configured to output a first microphone signal based on a measurement of sound measured from a first side of the earphone; a second microphone, configured to output a second microphone signal based on a measurement of sound measured closer to the second side the earphone than the sound measured by the first microphone; a speaker; an eartip, configured to seal the earphone between the first side and a second side of the earphone; a memory that stores instructions; and a processor, operatively connected to the first microphone, where the processor is

operatively connected to the speaker, where the processor is operatively connected to the memory, where the processor is configured to execute the instructions to perform operations, the operations comprising: sending a test fit signal to the speaker, where the speaker emits an audio test signal in response to the test fit signal; receiving the first microphone signal; comparing the microphone signal to the test fit signal to determine eartip seal; sending a first message to a user if the eartip seal is above a threshold level indicating a good seal, where the first message is visually displayed on a device communicatively coupled to the earphone; sending a second message to a user if the eartip seal is below a threshold level, indicating that a new eartip or adjustment of the current eartip is needed, where the second message is visually displayed on the device communicatively coupled to the earphone.

209. The Samsung Galaxy Buds 2 includes at least one earpiece having a first side and a second side. The Samsung Galaxy Buds 2 includes multiple microphones. A first microphone measures sound signal closer to the first side of the earpiece and a second microphone measures sound closer to the second side of the earpiece. The Samsung Galaxy Buds 2 includes a speaker for delivering sound to the ear canal of a user. An eartip is provided on the earpiece between the first and second sides of the earpiece to seal the ear canal.

210. The Samsung Galaxy Buds 2 includes both a processor and memory. The processor is operatively connected to the first microphone, the speaker, and the memory and sends a signal to the speaker to generate an audible chime within the ear canal as a fit test signal. The processor receives signals from the first microphone.

211. On information and belief, the processor compares the microphone signal to the test fit signal to determine the level of eartip sealing with respect to a threshold level. If the level of sealing is determined to be above the threshold level indicating a good seal for the earpiece the processor sends

a first message to a communicatively-connected device, e.g., a Samsung Galaxy S20 smartphone or other Samsung Galaxy smartphone, for display. If the level of eartip sealing is determined to be below the threshold indicating that a new eartip should be used or the earpiece should be adjusted by the user, the processor sends a second message to the connected device for display.

212. Defendants have had notice of their infringement of the '836 Patent since at least November 5, 2021, the date of filing of the initial complaint in this action.

213. Defendants have infringed and continue to, infringe the '836 Patent by actively inducing and contributing to the infringement of the '836 Patent by others, such as retailers and users of the Samsung Galaxy Buds 2 and Galaxy S20 smartphone within this District.

214. The Accused Products have no substantial non-infringing uses and are a material part of the invention of the '836 Patent. Any manufacture, use, sale, offer for sale, or importation in or into the United States of an Accused Product infringes the '836 Patent. Thus, the Accused Products have no substantial non-infringing uses.

215. Defendants' continued infringement of the '836 Patent has damaged and will continue to damage Plaintiffs.

216. Plaintiffs are entitled to recover damages adequate to compensate for Defendants' infringement.

217. After notice of their infringement of the '836 Patent, Defendants proceeded to make, use, test, sell, and/or offer to sell in this District and elsewhere in the United States, and import into this District and elsewhere in the United States, the Accused Products. Further, Defendants by disseminating marketing materials, providing user and technical manuals relating to the Accused Products, and by other acts have actively induced infringement by encouraging others to directly infringe the Asserted Patents such as by retailers selling Accused Products in this District and

elsewhere in the United States and by users of Accused Products using such products in this District and elsewhere in the United States in ways that directly infringe the Asserted Patents. Defendants knew or should have known that the acts they induced constituted patent infringement.

218. On information and belief, Defendants engaged in such activities despite an objectively high likelihood that their actions constituted infringement of the '836 Patent. Defendants knew and should have known that their actions would cause direct and indirect infringement of the '836 Patent.

219. Defendants have willfully infringed and continue to willfully infringe the '836 Patent.

#### **DEMAND FOR JURY TRIAL**

220. Pursuant to Fed. R. Civ. P. 38, Plaintiffs hereby demand trial by jury on all claims and issues so triable.

#### **PRAYER FOR RELIEF**

221. WHEREFORE, Plaintiffs respectfully request the following relief:

- a) A judgment that the Asserted Patents are valid and enforceable;
- b) A judgment that Defendants have infringed, directly and indirectly, either literally or under the Doctrine of Equivalents, one or more claims of the '839 Patent;
- c) A judgment that the Defendants' infringement of the '839 Patent was willful, and that the Defendants' continued infringement of the '839 Patent is willful;
- d) A judgment that Defendants have infringed, directly and indirectly, either literally or under the Doctrine of Equivalents, one or more claims of the '591 Patent;

- e) A judgment that the Defendants' infringement of the '591 Patent was willful, and that the Defendants' continued infringement of the '591 Patent is willful;
- f) A judgment that Defendants have infringed, directly and indirectly, either literally or under the Doctrine of Equivalents, one or more claims of the '400 Patent;
- g) A judgment that the Defendants' infringement of the '400 Patent was willful, and that the Defendants' continued infringement of the '400 Patent is willful;
- h) A judgment that Defendants have infringed, directly and indirectly, either literally or under the Doctrine of Equivalents, one or more claims of the '982 Patent;
- i) A judgment that the Defendants' infringement of the '982 Patent was willful, and that the Defendants' continued infringement of the '982 Patent is willful;
- j) A judgment that Defendants have infringed, directly and indirectly, either literally or under the Doctrine of Equivalents, one or more claims of the '244 Patent;
- k) A judgment that the Defendants' infringement of the '244 Patent was willful, and that the Defendants' continued infringement of the '244 Patent is willful;
- l) A judgment that Defendants have infringed, directly and indirectly, either literally or under the Doctrine of Equivalents, one or more claims of the '542 Patent;
- m) A judgment that the Defendants' infringement of the '542 Patent was willful, and that the Defendants' continued infringement of the '542 Patent is willful;

- n) A judgment that Defendants have infringed, directly and indirectly, either literally or under the Doctrine of Equivalents, one or more claims of the '424 Patent;
- o) A judgment that the Defendants' infringement of the '424 Patent was willful, and that the Defendants' continued infringement of the '424 Patent is willful;.
- p) A judgment that Defendants have infringed, directly and indirectly, either literally or under the Doctrine of Equivalents, one or more claims of the '082 Patent;
- q) A judgment that the Defendants' infringement of the '082 Patent was willful, and that the Defendants' continued infringement of the '082 Patent is willful;
- r) A judgment that Defendants have infringed, directly and indirectly, either literally or under the Doctrine of Equivalents, one or more claims of the '015 Patent;
- s) A judgment that the Defendants' infringement of the '015 Patent was willful, and that the Defendants' continued infringement of the '015 Patent is willful;.
- t) A judgment that Defendants have infringed, directly and indirectly, either literally or under the Doctrine of Equivalents, one or more claims of the '836 Patent;
- u) A judgment that the Defendants' infringement of the '836 Patent was willful, and that the Defendants' continued infringement of the '836 Patent is willful;
- v) A judgment that awards Plaintiffs all appropriate damages under 35 U.S.C. § 284 for Defendants' past infringement, and any continuing or future infringement of the Asserted Patents, including pre or post judgment interest,



costs, and disbursements as justified under 35 U.S.C. § 284 and, if necessary to adequately compensate Plaintiffs for Defendants' infringement, an accounting:

- i. That Plaintiffs be awarded enhanced damages by reason of the Defendants' willful infringement of the '839 Patent;
- ii. That Plaintiffs be awarded enhanced damages by reason of the Defendants' willful infringement of the '591 Patent;
- iii. That Plaintiffs be awarded enhanced damages by reason of the Defendants' willful infringement of the '400 Patent;
- iv. That Plaintiffs be awarded enhanced damages by reason of the Defendants' willful infringement of the '982 Patent;
- v. That Plaintiffs be awarded enhanced damages by reason of the Defendants' willful infringement of the '244 Patent;
- vi. That Plaintiffs be awarded enhanced damages by reason of the Defendants' willful infringement of the '542 Patent;
- vii. That Plaintiffs be awarded enhanced damages by reason of the Defendants' willful infringement of the '424 Patent;
- viii. That Plaintiffs be awarded enhanced damages by reason of the Defendants' willful infringement of the '082 Patent;
- ix. That Plaintiffs be awarded enhanced damages by reason of the Defendants' willful infringement of the '015 Patent;
- x. That Plaintiffs be awarded enhanced damages by reason of the Defendants' willful infringement of the '836 Patent;

- xi. That this case be declared exceptional within the meaning of 35 U.S.C. § 285 and that Plaintiffs be awarded their reasonable attorneys' fees against the Defendants incurred in prosecuting this action; and
- xii. That Plaintiffs be awarded costs and expenses incurred in prosecuting this action.
- w) A permanent injunction against Defendants, their subsidiaries, or anyone acting on their behalf from making, using, selling, offering to sell, or importing any products that infringe the Asserted Patents, and any other injunctive relief the Court deems just and equitable; and
- x) A judgment that Plaintiffs be awarded such further relief at law or in equity as the Court deems just and proper.

Dated: November 12, 2021

Respectfully submitted,

/s/ Bradford A. Cangro

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and Synergy IP Corporation*

**CERTIFICATE OF SERVICE**

I hereby certify that a true and correct copy of the above and foregoing document has been served on all counsel of record via the Court's ECF system on November 12, 2021.

/s/ Bradford A. Cangro  
Bradford A. Cangro